WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Automotive Body Repair Environmental Competency

DEPARTMENT OF ECOLOGY
HAZARDOUS WASTE AND TOXICS REDUCTION PROGRAM
PUBLICATION #97-409

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AUTOMOTIVE BODY REPAIR
Environmental Competency
Ecology Publication #97-409

SECTION A: Environmental Management

A.1. Understand the Importance of Environmental Management in the Shop Setting.

A.1.1. Describe why it is important to properly manage all wastes.

Performance Objective 1: The student will be able to list some reasons why they must properly dispose of the wastes they create.

1) To be in compliance with the laws.
2) To avoid fines from regulatory agencies.
3) To protect themselves and others from injury and illness.
4) To avoid being liable for environmental cleanup.
5) To prevent pollution.
6) To be a responsible citizen.
7) To stay in business.

A.1.2. Know where hazardous waste regulations are found and what agency enforces them.

Performance Objective 1: The student will be able to cite the legal reference for hazardous waste management requirements.

LAW: Chapter 70.105 RCW, **Hazardous Waste Management Act of 1976**

REGULATION: Chapter 173-303 WAC, the **Dangerous Waste Regulations** (The regulation implements the law).

Performance Objective 2: The student will know which Agency enforces the regulations and provides technical assistance, and how to obtain a copy of the regulations.

The **Dangerous Waste Regulations** are enforced by the State Department of Ecology. They can provide you with a copy. Ecology provides assistance to keep businesses in compliance with the laws.

A.1.3. Understand the purpose of the "Waste Management Hierarchy".

Performance Objective 1: The student will understand what the Waste Management Hierarchy is.

- The Waste Management Hierarchy was set by the legislature to encourage reduction and recycling of wastes instead of disposal.
- The purpose is to provide environmental protection by preventing wastes from being generated rather than controlling the wastes after they have been created.
- Being "in compliance" with the laws means you are doing what is required. The goal of the hierarchy is to think "beyond compliance", to go the next step to eliminate, reduce, reuse, or recycle your waste.

Performance Objective 2: The student will understand the methods of handling waste in the preferred order, and provide an example of each.

Waste Reduction **- To not create a waste in the first place.**

- Scheduling paint jobs by color to reduce spraygun cleanup.
- Switching from chlorinated to non-chlorinated cleaners and solvents.
- Extending the life of paint thinner by settling solids and decanting the liquid for reuse.

Recycling **- Reclaim or reuse the waste.**

- Using shop towels that are laundered by a permitted laundry.
- Recycling floor mop water into cabinet washers.
- Recycling spraygun solvents in a closed, recirculating gun washer.
- Recycling cleaning solvents in a solvent distillation unit (if allowed by the local fire department.)

Treatment **- To perform a process on the waste to eliminate its hazards or prepare it for disposal.**

- Evaporating cabinet washer water to reduce it's volume.

Incineration **- To thermally destroy a waste in an approved incinerator.**

- Sending hazardous waste a to facility to be thermally destroyed.

Landfill **- To put into an appropriate landfill.**

- Sending hazardous waste to a designated Hazardous Waste Landfill.

Performance Objective 3: Given waste streams typical of the shop, the student will be able to determine if it there is a more environmentally sound way to manage the waste.

Performance Objective 4: The student will be able to articulate why waste reduction is the highest priority.

Land disposal and incineration of wastes can be harmful to the environment and costly for the generator. By reducing the amount of waste produced, you can:

1) Protect the environment and human health
2) Save money
3) Reduce your financial liabilities
4) Avoid some regulations

A.1.4. Understand what is meant by the term "pollution prevention".

Performance Objective 1: The student will be able to articulate what "pollution prevention" means and provide general examples.

Pollution prevention is any method of reducing the amount of toxic materials used or released to the environment. It can be accomplished by:

- Replacing toxic materials with less toxic or non-toxic substitutes.
- Changing a process so a hazardous material is no longer needed.

A.1.5. Understand why pollution prevention is desirable.

Performance Objective 1: The student will be able to articulate how pollution prevention can benefit business, employees, and the environment.

- Reducing or replacing toxic materials reduces exposure to harmful substances, creating a healthier, safer workplace.
- By preventing wastes from being generated, you reduce hazardous waste management and disposal costs and liability.

A.2. Understand the basic waste management elements which are required by law for waste accumulation areas, containers, and labeling.

A.2.1. Describe the key requirements of waste accumulation areas.

Performance Objective 1: The student will be able to describe the key required elements of a waste accumulation area.

Waste accumulation areas must:

- Be well defined
- Be well marked with warning signs
- Have secondary containment

Performance Objective 2: The student will understand what secondary containment is and determine if it is sufficient in a given waste storage situation.

Secondary containment:

- Waste storage areas must have the ability to contain spills from tipped, overfilled, or ruptured containers.
- The containment must be able to hold 10 percent of the capacity of all stored containers or 110 percent capacity of the largest container, whichever is greatest.

A.2.2. Identify the basic waste container management requirements.

Performance Objective 1: The student will be able to identify the basic waste container management requirements.

1) Must be *suitable* for the waste
2) Must be in good *condition* and able to hold the waste
3) Must be kept *closed*
4) Must be *labeled* as hazardous waste
5) Must be *labeled* with the appropriate risk warning.

Performance Objective 2: The student will be able to determine if a container is appropriate for a given waste stream.

1) Suitability

Type of Waste:	Appropriate Container:
Waste Solvent	Metal container
Waste Corrosives	Plastic container
Waste Acids	Plastic container

2) Condition

Appropriate:	Not Appropriate:
Clean	Contaminated with other waste
Can hold the waste	Cannot hold waste due to: Sprung seams dents, holes, rust

Performance Objective 3: The student will be able to demonstrate how to close and label a container.

1) Keep Closed: Containers must be kept closed except when emptying or filling.

- The bung should be screwed in tightly.
- Ring lock, if present, should be closed securely to avoid leaks.
- Funnels should be removed except self-closing ones.

*2) **Labeled:*** Waste containers must be labeled with:

Information on label:	Example:
Dangerous waste	"DANGEROUS WASTE"
The type of waste described	"USED LACQUER THINNER"
The hazards listed	"FLAMMABLE"

A.3. Understand what the requirements are for spill prevention and cleanup.

Performance Objective 1: The student will be able to articulate the key elements of a spill response plan.

- Instructions on what to do when hazardous materials are spilled
- Who to notify
- The type of personal protection equipment needed
- The location of the spill cleanup supplies
- How to neutralize spills, if possible
- How to dispose of the wastes after cleanup
- How to prevent spills from occurring

Performance Objective 2: The student will be able to demonstrate what to do in case of a large spill of hazardous material.

- Locate and properly use spill response materials
- Contain the spill
- Contact the proper authorities
- Clean it up
- Manage the wastes properly

SECTION B: Autobody Waste Management

B.1. Understand what solid, hazardous, and conditionally exempt wastes are generated in vehicle body repair work and how they are best handled.

B.1.1. Identify the specific solid wastes produced in vehicle body repair and understand the potential hazards they pose, if any.

Performance Objective 1: The student will be able to identify the common solid wastes that are generated when doing vehicle body repair work.

Waste	Potential Hazard
Air bags, deployed	Contains small amounts of sodium hydroxide and metallic sodium, chemical burn hazard
Floor sweepings	Inhalation; possible heavy metal content
Paint booth filters	Possible heavy metal content; possible solvent content
Masking tape and masking paper	Possible heavy metal content; possible solvent content
Scrap metal body parts	Sharp edges; crushing danger
Scrap plastic body parts	Sharp edges

B.1.2. Identify the preferred handling method of specific solid wastes that are produced in vehicle body repair.

Performance Objective 1: The student will know the preferred method of handling each of the above wastes.

Solid Wastes	Appropriate handling method
Air bags, deployed	May be reclaimed, recycled, or disposed of as solid waste.
Floor sweepings	May be put into the dumpster and disposed of as solid waste if the paints used did not contain lead, cadmium, barium, or chrome. If the paints used contained lead, cadmium, barium, or chrome, the floor sweepings must be handled and disposed of as dangerous waste. The amount generated can be reduced by keeping body filler dust separated from paint sanding and overspray as much as possible.

Paint booth filters	Dry and dispose as solid waste if paints used did not contain lead, cadmium, barium, or chrome. If paints containing these metals were used, the filter must be disposed as dangerous waste.
Masking tape and paper	Dispose as solid waste when dried.
Metal body parts	Use personal protective equipment, such as gloves, when handling to avoid injury. Recycle as scrap metal.
Plastic body parts	Use personal protective equipment, such as gloves, when handling to avoid injury. Recycle when possible.

B.1.3. Identify the specific hazardous wastes generated in vehicle body repair and the hazards that these wastes pose.

Performance Objective 1: The student will be able to identify the common dangerous (hazardous) wastes that come from vehicle body repair and the hazards they pose.

Dangerous Waste	Hazard
Air bags, undeployed	Reactive, contains acutely toxic sodium azide; explosive danger.
Distillation bottoms	Typically toxic and flammable; may contain heavy metals.
Sump sludge	May contain solvents or heavy metals.
Parts washer solvent	Typically flammable and toxic.
Waste lacquer thinner	Flammable and toxic.
Waste paints	Typically toxic, possibly flammable, and may contain heavy metals.

B.1.4. Understand the preferred handling method of specific hazardous wastes that are produced in vehicle body repair.

Performance Objective 1: The student will be able to identify the appropriate handling methods for dangerous wastes from autobody repair.

Dangerous Wastes	Appropriate handling method
Air bags, undeployed	Handle with care to prevent explosion. Special equipment and training required for removal. Remove so they can be reused. Unused air bags must either be reclaimed or disposed of as dangerous waste. Normally, damaged undeployed air bags can be shipped to the manufacturer for repair.
Distillation bottoms	Distillation or still bottoms are the residue of a solvent still. If the solvent would be a dangerous waste, the still bottoms will as well. Bottoms are flammable and may contain heavy metal. Manage and dispose of as dangerous waste, not disposed to dumpster.
Sump sludge	Sump sludge should be tested to determine if they are dangerous waste due to heavy metals, or solvents which have been washed from the floor to the drain. If tests show the sludge is hazardous, send it to a hazardous waste management facility.
Parts washer solvent	Recycle through service provider or dispose as dangerous waste. Extend change out time until solvent is unusable. If alternative solvents are used, they may not designate as dangerous waste when disposed.
Waste lacquer thinner	Recycle as dangerous waste, or dispose as dangerous waste.
Waste paints	Dispose as dangerous waste.

B.1.5. Understand which wastes from vehicle body repair are "conditionally exempt" and why.

Performance Objective 1: The student will be able to identify wastes that come from vehicles which are dangerous waste, but can be conditionally exempt from the regulations is managed according to best management practices. Describe when these wastes are conditionally exempt.

Waste	When Exempt From Regulations
Antifreeze	When it is recycled.
Batteries	When they are recycled.
Freon	When it is captured and recycled.
Shop towels	When they are cleaned by laundry service.
Used Oil	When it is re-refined. If it is burned for energy recovery, some regulations may apply.

B.2. Understand what cross-contamination of vehicle wastes is and how to avoid it.

B.2.1. Define "cross contamination" and why it is undesirable.

Performance Objective 1: The student will understand what is meant by "cross contamination" and be able to provide reasons why it is undesirable.

Combining a waste with a different waste will cause the mixture to be more difficult to manage, almost impossible to recycle or reuse, or more expensive to manage. It could even cause a chemical reaction that could produce an explosion or toxic gases.

Mixing an exempt waste or a solid waste with a hazardous waste will cause the whole mixture to be classified as a hazardous waste, and subject to the regulations.

B.2.2. Describe common occurrences of cross-contamination.

Performance Objective 1: The student will be able to give examples of common occurrences of cross-contamination

- Using one drain pan to catch different waste fluids, without cleaning out the pan thoroughly when collecting the different fluids.

- Adding any spent lacquer thinner (a dangerous waste) to antifreeze or used oil (conditionally exempt wastes) will make the antifreeze or used oil dangerous waste. It will then be non-recyclable, no longer conditionally exempt from the dangerous waste regulations, and more difficult and costly to dispose of.

- Drums of solvent and used oil in a secondary containment area leak and the wastes mix together, creating a regulated waste that must be disposed as dangerous waste, rather than each waste being recyclable.

B.2.3. List management practices to avoid cross contamination.

Performance Objective 1: After understanding the definition of cross contamination and giving several examples of it, the student will be able to describe how to avoid cross contamination of wastes.

- Keep waste streams separate. Use separate pans for oil, antifreeze, brake fluid, and any other fluid that are drained from the vehicle.

- Put the waste in properly labeled containers that don't leak, are not damaged, and can be securely closed.

- Keep wastes with different recycling methods in separate secondary containment areas. For example, lacquer thinner, used oil and antifreeze should be kept in separate containment areas.

B.3. Understand what wastewater is, where it is generated, and how to manage it appropriately.

B.3.1. Define wastewater.

Performance Objective 1: The student will be able to define the term "wastewater".

Wastewater is water that has been used for a purpose, but is no longer usable for that purpose, and will be disposed of. All process wastewater should go to a sewer and not to any other type of drain.

B.3.2. Identify the common wastewater discharge destinations and which wastewater can be disposed to each.

Performance Objective: The student will be able to name five places where wastewaters are discharged and the appropriate wastes that can be discharged to each.

Discharge point:	**Wastewater allowed:**
Storm drains	Stormwater, rainfall, snowmelt.
Sanitary sewer	Industrial waters, sewage; floor wash water.
Septic system	Sanitary sewage, domestic wastewater.
Combined storm/sewer* industrial	Treated stormwater, rainfall, snowmelt, process waters and sewage.
Dry well	Treated stormwater, rainfall, snowmelt.

(A combined drain system allows for stormwater to be collected and run to the sewer. It is a sewer system with some storm drains linked to it. At no time is sewer water allowed to go to a storm drain.)*

B.3.3. Identify the common wastewater sources in vehicle body repair shops and the appropriate discharge method.

Performance Objective 1: The student will be able to identify the four main sources of wastewater discharge from vehicle body repair shops identify the appropriate way to discharge.

Wastewater Source	Discharge to:
Floor cleaning wastewater	Oil/water separator* and then sanitary sewer.
Steam cleaning wastewater	Oil/water separator and then sanitary sewer.
Pressure washing wastewater	Oil/water separator and then sanitary sewer.
Vehicle sanding washwater	Oil/water separator and then sanitary sewer.
Vehicle washing wastewater	Oil/water separator and then sanitary sewer.

* *Used generically. there are many types of treatment available.*

B.3.4. Identify methods to minimize the amount of wastewater discharged.

Performance Objective 1: The student will be able to identify ways to minimize the discharge from the following sources.

Wastewater Source	How to minimize discharge:
Floor cleaning wastewater	Use mop and bucket instead of flushing the floor with water.
Steam cleaning wastewater	Use brush to physically remove most dirt before washing. Reuse and recirculate water until unusable
Pressure washing wastewater	Use brush to physically remove most dirt before washing. Reuse and recirculate water until unusable
Vehicle sanding washwater	Use a damp cloth or vacuum to remove most of the sanding dust before rinsing the vehicle. Reuse and recirculate water until unusable
Vehicle washing wastewater	Use brush to physically remove most dirt before washing. Reuse and recirculate water until unusable

B.3.5. Identify wastewater discharge criteria to sewers.

Performance Objective 1: The student will list three situations when a wastewater may not be discharged without treatment prior to disposal.

Wastewater may not be discharged if:

1. It exceeds the treatment plants discharge limit on **fats, oils, and greases.**
2. It exceeds the acceptable **pH range**, either higher or lower
3. It designates as a **Dangerous Waste.**

B.4. Understand what cleaning process wastes are and how they are best handled.

B.4.1. Define cleaning process wastes.

Performance Objective 1: The student will be able to identify the main cleaning process wastes generated from autobody repair.

- Shop towels
- Spent solvent from cleaning sprayguns and spray painting equipment
- Vehicle washing wastewater
- Floor cleaning wastewater
- Steam or pressure washing wastewater

B.4.2. Describe how to manage cleaning process wastes.

Performance Objective 1: The student will be able to describe how the wastes generated from cleaning processes should be handled.

- Shop towels that are laundered by a commercial laundry are exempt from hazardous waste regulations. Disposable shop towels may need to be handled as dangerous waste, depending on what is on them.

- Spent solvent from gunwashers and spraygun equipment cleaning should be managed as dangerous waste and either be recycled or disposed as dangerous waste.

- Floor cleaning wastewater should be minimized by sweeping floors before washing. The floor washwater should be discharged to a sanitary sewer.

- Vehicle washing wastewater should be discharged to an oil water separator and then to a sanitary sewer system.

- Steamcleaning or pressure washing wastewater should be discharged to an oil water separator and then to a sanitary sewer system.

B.5. Identify the main sources of air pollutants found in vehicle body repair shops and how to control the releases.

B.5.1. Identify sources of air pollutants

Performance Objective 1: The student will be able to identify at least three of the sources of air pollutants present in autobody repair shops.

- Volatile organic compounds (VOC's) from painting
- Solids from painting
- Freon from air-conditioning servicing
- Solvents from air-drying solvent soaked parts
- Air-borne substances from spray cans

B.5.2. Understand how to minimize and/or control releases of air pollutants.

Performance Objective 1: The student will be able to describe ways to minimize and control releases to the air of the following:

Air Release Source	**How to minimize discharge:**
VOC's from painting	High volume/low pressure (HVLP) sprayguns; emissions control systems.
Solids from painting	HVLP sprayguns; spray booth filters; downdraft wet booths.
Freon	Certified technicians; approved equipment.
Solvents	Enclosed gunwashers for spraygun cleaning; keep gunwasher closed as much as possible.
Aerosol spray cans	Use refillable spray cans that don't mist the spray.

Environmental Competencies
- - - Evaluation - - -

Dear Vocational Instructor: *In order to improve our services, the* ***Department of Ecology*** *asks you to please complete this evaluation on the environmental competencies you have used. We will use your comments for future revisions. THANK YOU !*

This evalution is for the environmental competency in (Circle):
AUTO REPAIR AUTO BODY DENTAL PHOTO WOODWORKING

Ranking: Level of satisfaction / agreement: **1 = Low 5 = Average 10 = High**

1). The information in this competency is appropriate for the students.
1 2 3 4 5 6 7 **8 9 10**

2). The level of detail was sufficient for me to teach it.
1 2 3 4 5 6 7 **8 9 10**

3). The supplemental materials answered most of my questions.
1 2 3 4 5 6 7 **8 9 10**

4). It was easy to incorporate the competency into the curriculum.
1 2 3 4 5 6 7 **8 9 10**

5). The layout was clear and easy to use.
1 2 3 4 5 6 7 **8 9 10**

6). It is important for students to learn about environmental management.
1 2 3 4 5 6 7 **8 9 10**

7). "I have incorporated this information into my curriculum."
1 2 3 4 5 6 7 **8 9 10**

8). Additional comments, or suggestions:_____
_____
_____

9). Requests for additional info:_____
_____
_____

10). Name & Program: _____
School: _____

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